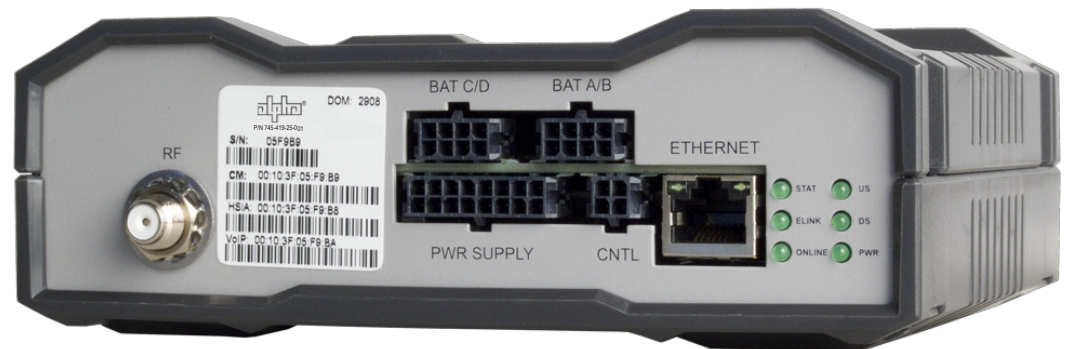


Power



Alpha XP-EDH4 Transponder

Field Installation Instructions

Effective: September 2009

AlphaNet™ Series External DOCSIS Transponder

Model XP-EDH4

745-419-C4-001, Rev. A (09/2009)

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Contacting Alpha Technologies: www.alpha.com

For general product information and customer service (7 AM to 5 PM, Pacific Time), call

1-800-863-3930,

For complete technical support, call

1-800-863-3364

7 AM to 5 PM, Pacific Time or 24/7 emergency support

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1.0 Overview to the Field Installation Instructions

The EDH4 transponder provides the ability to manage network power through an existing cable modem infrastructure, for a variety of power supplies as shown in this document.

The steps comprising the installation procedure are as follows:

1. Setting the jumpers and switches in their respective communications cards [Section 2.0]
2. Connecting the transponder to its respective power supply and system equipment [Section 3.0]
3. Verifying Installation and network connectivity [Section 4.0]

Save these instructions for future reference.

Installation Notes:

- Before field installation, the transponder's MAC address should be loaded into the CMTS, and DOCSIS configuration file options should be set.
- Use a surge protector in the cabinet when the transformer is used to measure line voltage.
- Do not place the transponder on top of the power supply or batteries.
- Make all battery harness connections and connect the interface cable to the power supply before connecting the cables to the transponder.



CAUTION!

When the EDH4 replaces an existing EDH2 or EDH3 Transponder, do not plug the AUX PWR cable into the connector labeled CNTL. Although these connectors are identical in shape, the functionality between them is different. The CNTL connection provides power for the Battery heater mat. System damage will occur if the AUX PWR cable is plugged into the CNTL connector. Contact Alpha Technologies regarding the disposition of the existing AUX PWR cable.

2.0 Communications Card settings

Verify the switches and jumpers on the respective communications cards are set as indicated in the tables below.



NOTE:

Alpha AM power supplies with RPM interface cards marked 700-019-28, 700-019-31 and 700-019-40 are compatible with the DOCSIS HMS Analog Transponder.

XM - USM
P1 = 2 & 3
P2, P4, P5, P6 = Closed
P3 = Open
P7 = 5V
P8, P9, P13 = 1 & 2
P14 = N/A
SW4 = 0

Table 1, XM-USM switch settings

XM2 - USM2
SW1-1, 2, 6, 8 = On
SW2-1, 3, 4 = On
JP1 = C & 1
JP2 = 1 & 2

Table 2, XM2-USM2 switch settings

XM2 - USM2.5
SW1-1, 2, 6 = On

Table 3, XM2-USM2.5 switch settings



NOTE:

Output Current switch settings are determined by the output current capability of the power supply and must be configured accordingly. Refer to your power supply user manual for setting details.

Typical I_{out} settings for the following communications cards:

- USM: N/A
- USM2: SW1-3 = Output #1, SW1-4 = Output #2
- USM2.5: SW1-3 = Output Current Scaling, 15A or 22A
- RPM: No switch setting required

3.0 Connection Instructions



NOTE:

A chipset upgrade may be required; contact Alpha for more information.
Set the jumpers and calibrate the USM card before making connections and applying the load.

3.1 AM Series Power Supply Connection

1. Switch Battery Breaker OFF.
2. It is advisable to install the Battery cable (providing power to the External DOCSIS unit) and waiting until the ONLINE LED is on steady before installing the power supply. This will reduce the chances of the power supply transferring to inverter due to a low signal reference on the test control pin.
3. Connect the transponder to the system as shown in figure 3.

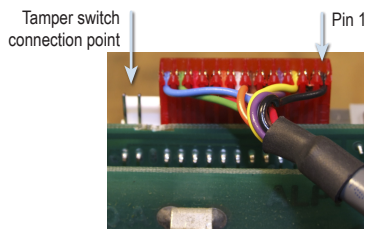


Figure 1, 13-pin connector on AM Series power supply

When connecting to an AM Series power supply, plug the 13-pin connector so the black wire is in pin1 and two open pins are left at the left for tamper switch connection (as viewed from the front of the unit).

Legend

1	RF Cable	
2, 3	Battery Sense Wire Kit for:	36V single string, 6', Alpha p/n 874-842-21
		36V single string, 9', Alpha p/n 874-842-27
		36V dual string, 6', Alpha p/n 874-842-20
		36V dual string, 9', Alpha p/n 874-842-28
		48V single string, 6', Alpha p/n 874-841-21
		48V single string, 9' Alpha p/n 874-841-25
		48V dual string, 6', Alpha p/n 874-841-20
		48V dual string, 9', Alpha p/n 874-841-24
4	XM Series 2 Power Supply Interface Cable	Alpha p/n 875-335-20 (USM2/2.5)
	XM Series Power Supply Interface Cable	Alpha p/n: 875-335-21 (USM)
	AM Series Power Supply Interface Cable	Alpha p/n: 875-335-21 (RPM)
5	Battery Heater Mat Control Cable	Alpha p/n 875-627-20
6	Ethernet Cable (optional)	Customer supplied
7	RTS Cable (optional)	Alpha p/n 745-178-21
8	Vin Sense (optional)	Alpha p/n 875-493-21
9	Surge Protector Ground Block	Alpha p/n 162-028-10
10	Plug-in Lightning Arrestor w/pass thru (130V) L-G, L-N, N-G	Alpha p/n 162-046-10

3.2 XM Series Power Supply Connection

1. Switch Battery Breaker OFF prior to removing the Inverter Module for USM Card installation and configuration.
2. It is advisable to install the Battery cable (providing power to the External DOCSIS unit) and waiting until the ONLINE LED is on steady before installing the power supply. This will reduce the chances of the power supply transferring to inverter due to a low signal reference on the test control pin.

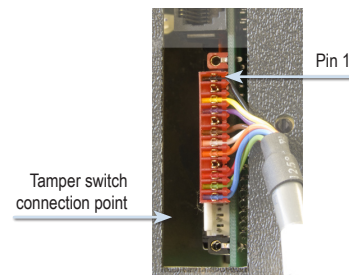


Figure 2, 13-pin connector on XM Series power supply

When connecting to an XM Series power supply, plug the 13-pin connector so the black wire is in pin1 and two open pins are left at the bottom for tamper switch connection (as viewed from the front of the unit).

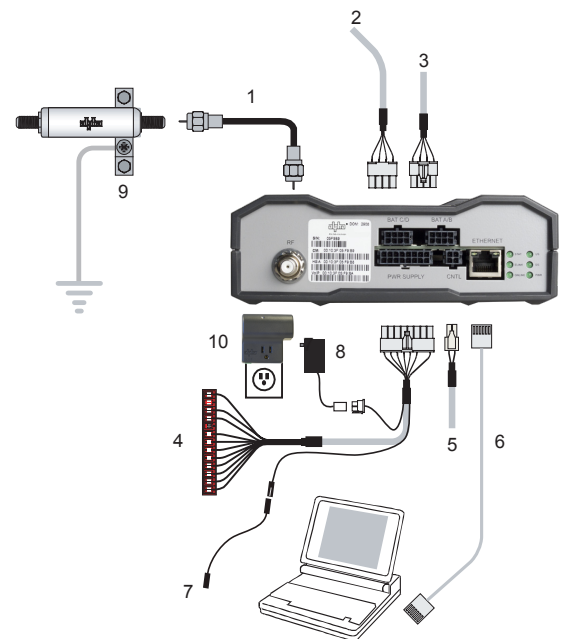


Figure 3, Connecting the transponder to the system

3.3 XM Series 2 Power Supply



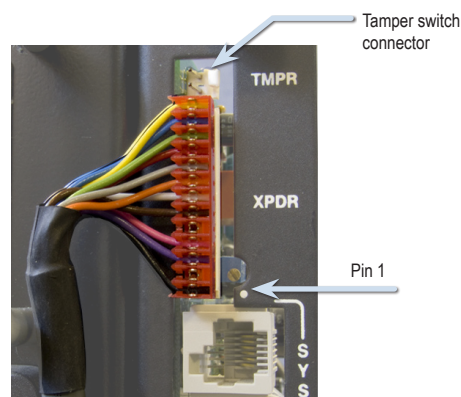
WARNING!

The XM2 batteries are isolated from chassis ground by design. Any voltage potential difference between battery (-) and chassis ground must be eliminated before installing the transponder to avoid potential transponder damage. To accomplish this, attach a ground jumper between battery (-) and chassis ground before installing the transponder. Once the transponder is installed the jumper may be removed if desired.

Switch Battery Breaker OFF prior to removing the Inverter Module for USM2/USM2.5 Card installation and configuration.

XM SERIES 2 POWER SUPPLY CONNECTION NOTE:

When connecting to an XM Series 2 power supply, plug the 13-pin connector so the black wire is in pin1 and two open pins are left at the top for tamper switch connection.



Legend

1	RF Cable	
2, 3	Battery Sense Wire Kit for:	36V single string, 6', Alpha p/n 874-842-21
		36V single string, 9', Alpha p/n 874-842-27
		36V dual string, 6', Alpha p/n 874-842-20
		36V dual string, 9', Alpha p/n 874-842-28
		48V single string, 6', Alpha p/n 874-841-21
		48V single string, 9' Alpha p/n 874-841-25
		48V dual string, 6', Alpha p/n 874-841-20
		48V dual string, 9', Alpha p/n 874-841-24
4	XM Series 2 Power Supply Interface Cable	Alpha p/n 875-335-20 (USM2/2.5)
	XM Series Power Supply Interface Cable	Alpha p/n: 875-335-21 (USM)
	AM Series Power Supply Interface Cable	Alpha p/n: 875-335-21 (RPM)
5	Battery Heater Mat Control Cable	Alpha p/n 875-627-20
6	Ethernet Cable (<i>optional</i>)	Customer supplied
7	RTS Cable (<i>optional</i>)	Alpha p/n 745-178-21
8	Vin Sense (<i>optional</i>)	Alpha p/n 875-493-21
9	Surge Protector Ground Block	Alpha p/n 162-028-10
10	Plug-in Lightning Arrestor w/pass thru (130V) L-G, L-N, N-G	Alpha p/n 162-046-10

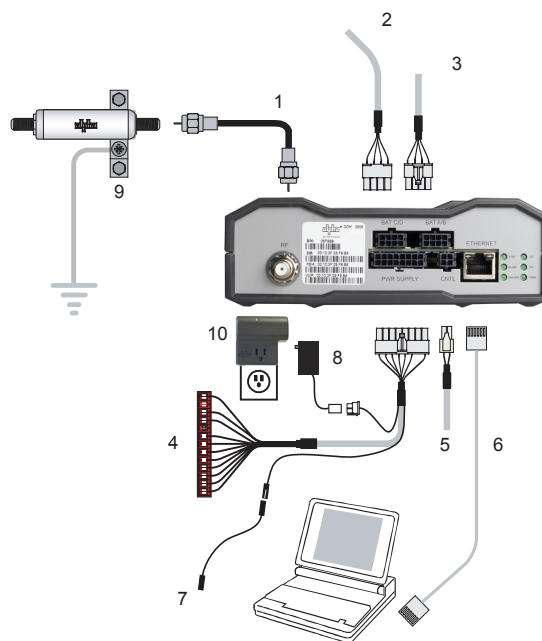


Figure 4, Connections between the transponder and the system

3.4 ZTT and ZTT+ Power Supplies



CAUTION!

Installation of the V_{out} and I_{out} sense harness requires powering down the power supply. Use an alternate source of power during this procedure.

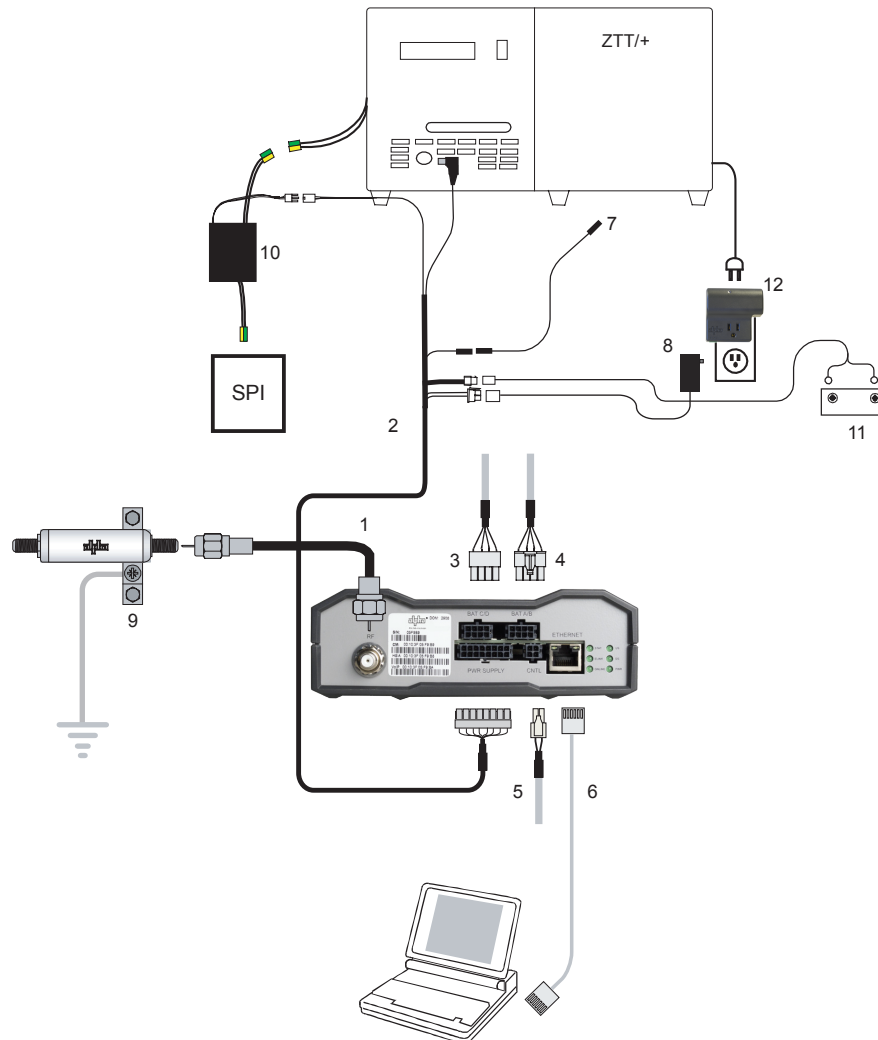


Figure 5, Connections between the transponder and the system

Legend

1	RF Cable		8	Vin Sense (optional)	Alpha p/n 875-493-21
2	Power Supply Interface	Alpha P/N: 875-335-22 (ZTT and ZTT+ Post 1998) Alpha P/N: 875-335-23 (ZTT+ Pre 1998)	9	Surge Protector Ground Block	Alpha p/n 162-028-10
3,4	Battery Sense Wire Kit for:	36V single string, 6', Alpha p/n 874-842-21	10	Vout Iout Sense Harness	Alpha p/n 875-456-10
		36V single string, 9', Alpha p/n 874-842-27	11	Tamper Wire Kit	Enclosure-specific
		36V dual string, 6', Alpha p/n 874-842-20	12	Plug-in Lightning Arrestor w/pass thru (130V) L-G, L-N, N-G	Alpha p/n 162-046-10
		36V dual string, 9', Alpha p/n 874-842-28			
		48V single string, 6', Alpha p/n 874-841-21			
		48V single string, 9' Alpha p/n 874-841-25			
		48V dual string, 6', Alpha p/n 874-841-20			
		48V dual string, 9', Alpha p/n 874-841-24			
5	Battery Heater Mat Control cable	Alpha p/n 875-627-20			
6	Ethernet Cable	Customer-supplied			
7	RTS Cable (optional)	Alpha p/n 745-178-21			

3.5 Generic Model Power Supplies



CAUTION!

Installation of the V_{out} and I_{out} sense harness requires powering down the power supply. Use an alternate source of power during this procedure.

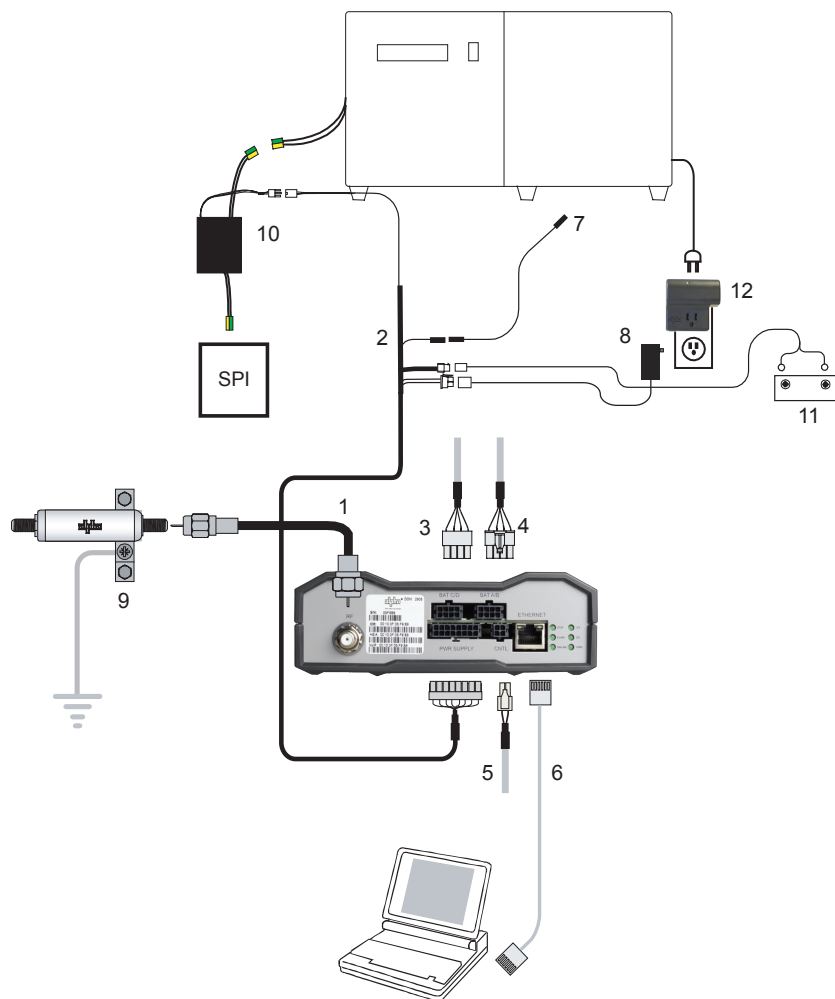


Figure 6, Connections between the transponder and the system

Legend

1	RF Cable		8	Vin Sense (optional)	Alpha p/n 875-493-21
2	Power Supply Interface	Alpha p/n: 875-335-25	9	Surge Protector Ground Block	Alpha p/n 162-028-10
3,4	Battery Sense Wire Kit for:	36V single string, 6', Alpha p/n 874-842-21	10	Vout Iout Sense Harness	Alpha p/n 875-456-10
		36V single string, 9', Alpha p/n 874-842-27	11	Tamper Wire Kit	Enclosure-specific
		36V dual string, 6', Alpha p/n 874-842-20	12	Plug-in Lightning Arrestor w/pass thru (130V) L-G, L-N, N-G	Alpha p/n 162-046-10
		36V dual string, 9', Alpha p/n 874-842-28			
		48V single string, 6', Alpha p/n 874-841-21			
		48V single string, 9' Alpha p/n 874-841-25			
		48V dual string, 6', Alpha p/n 874-841-20			
		48V dual string, 9', Alpha p/n 874-841-24			
5	Battery Heater Mat Control cable	Alpha p/n 875-627-20			
6	Ethernet Cable	Customer-supplied			
7	RTS Cable (optional)	Alpha p/n 745-178-21			

4.0 Verifying Installation and Network Connectivity *(applies to all power supplies)*

After connecting the transponder, any of the three following methods may be used to verify the installation and network connectivity.

4.1 LED Indications

The EDH4 transponder has bank of 6 green LEDs on the front panel. The state (whether each LED is ON, OFF, or blinking) of each LED indicates its operational functionality as indicated in the table below.

On initial power up, the LEDs will remain off for several seconds after which time the DS, US, and Online LEDs will blink, in unison, 6 times. After this sequence completes, the LEDs indicate the status. The PWR, DS, US, ONLINE, and ELINK LEDs conform to the DOCSIS OSSI specification.

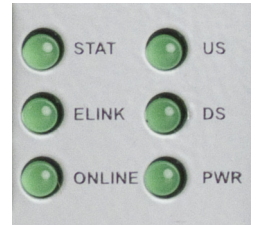


Figure 7, LED Array

LED	Function	State	Meaning
STAT	Debug LED: Indicates the presence or absence of data transference between the transponder's two processors.	Off	Data is not being transferred between the two processors.
		Blinking	Data is being transferred between the two processors.
ELINK	CPE Link LED: Indicates status with respect to the bridging of data to and from a CPE device connected to the transponder's Ethernet port	Off	A CPE device is not connected to the transponder's Ethernet port.
		Blinking	The transponder is bridging data to/from a CPE device.
ONLINE	Online LED: Indicates status with respect to the completion of the IP initialization process and when the unit is operational.	Blinking	The transponder is currently involved in the IP initialization process.
		On	The transponder has completed the IP initialization process and is operational.
US	Upstream LED: Indicates status with respect to acquisition of upstream parameters and initial ranging.	Blinking	The transponder is obtaining upstream parameters and is performing initial ranging.
		On	The transponder has completed a successful initial ranging sequence.
DS	Downstream LED: Indicates status with respect to downstream scanning and synchronization.	Blinking	The transponder is scanning for a downstream DOCSIS channel.
		On	The transponder has locked onto and synchronized with a downstream DOCSIS channel.
PWR	Power LED: <i>(Note: this LED is not tied directly to line power)</i>	Off	The transponder is not powered or is not functioning.
		On	The transponder is on.

Table 4, LED Indications of System Status

4.0 Verifying Installation and Network Connectivity *(applies to all power supplies), cont'd.*

4.2 Locally via a Web browser

Configuring the EDH4 transponder

Connect a computer's network port to the transponder's Ethernet port using a standard network cable. Launch an Internet browser and enter 192.168.100.1 into the Address. The transponder will return the Web page shown below. Click on "Config" to display the available power supply types, and single / Dual IP configurations. Click on the one that matches the connected power supply and desired IP mode. Click on "Apply," and when prompted for a User Name and Password, enter "Tollgrade" (without the quotes) in both places and click on "OK."

The transponder will reset (the LEDs will go through a typical power up sequence) and begin communicating with the power supply and the cable network.

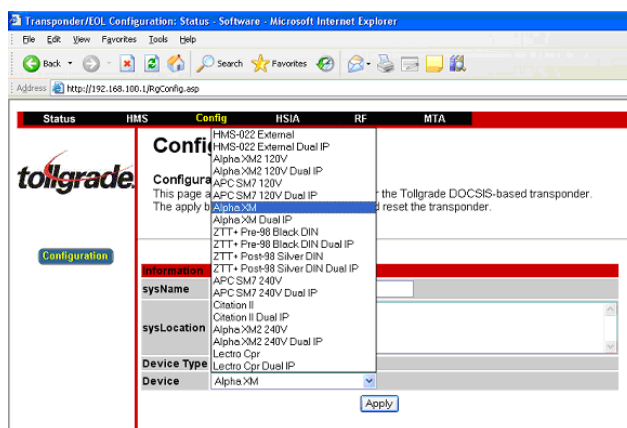


Figure 8, Configuration Screen [selection of power supply shown]

Communication with the headend may be verified by clicking on the "Status" link, which will display key parameters including upstream and downstream power levels, and the cable modem's IP address, which confirms connectivity.

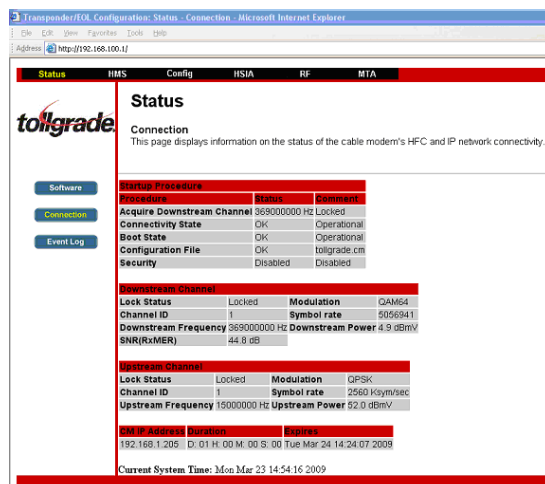


Figure 9, Status Information Screen

4.0 Verifying Installation and Network Connectivity *(applies to all power supplies), cont'd.*

4.2 Locally via a Web browser, *continued*

Once the transponder is online, power supply data is also available via the Web page. Click on “HMS,” and then “PS1” to see information which confirms the battery sense harness is connected properly and the transponder is configured for the right power supply.

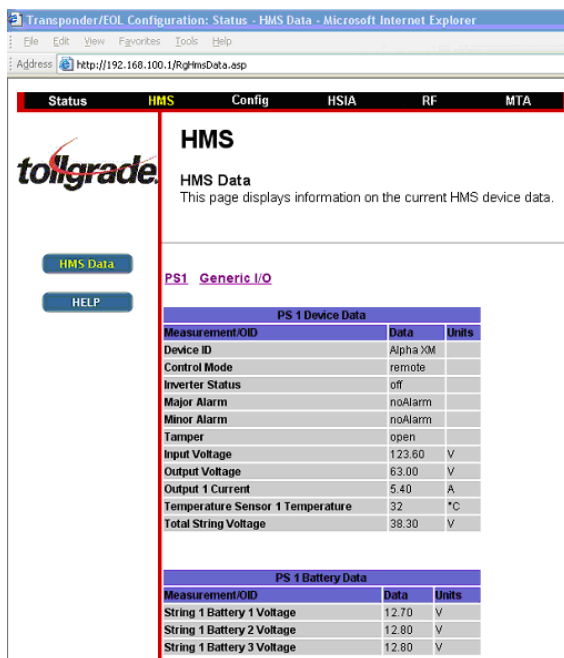


Figure 9, HMS Device Data Screen

4.3 Remote via HTTP

Enter the cable modem's network IP address into a Web browser and follow the steps in Section 4.2.

4.4 Remote via SNMP

Enter the cable modem's network IP address into a MIB browser and use “DOCSIS” for both the get and set community strings.

Query the power supply's input voltage. [OID: 1.3.6.1.4.1.5591.1.4.2.1.23.1] A valid response verifies remote SNMP communications.

Power

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